UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,609	08/30/2002	Rino Messere	214502US0PCT	6443

22850 7590 07/07/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
UHLIR, NIKOLAS J	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/926,609	MESSERE ET AL.
	Examiner	Art Unit
	Nikolas J. Uhlir	1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment/request for continued examination dated 06/18/2004. Currently, claims 27-51 are pending.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 27-29, 31, 33-48, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scholz et al. (US5753373).

4. The examiner notes that the Scholz reference was cited in an earlier office action.

5. Claim 27 requires a transparent glazing comprising at least one viewing area, wherein the viewing area has deposited on at least one surface thereof an antifrosting adsorbent layer, and wherein said at least one surface and antifrosting adsorbent layer, after being maintained in a closed refrigerated environment at -28^0 C, prevents the visible formation of condensation and frosting for at least three minutes upon rapid exposure to room temperature and humidity.

6. Regarding these limitations, Scholz et al. (Scholz) teaches a coating composition having anti-reflective and anti-fogging properties, wherein the coating composition is adventitiously applied to substrates such as windows and windshields (column 20, lines 13-31. The anti-fog function of the coating is performed by the coating either resisting the formation of water droplets on its surface or by adhering a uniform film of water on its surface such that the transparency of the film is not reduced (column 5, lines 30-47).

7. The adherence of a gas, liquid or vapor at the surface of a material is the quintessential definition of adsorption. Accordingly, the examiner takes the position that the Scholz film meets the requirement of an antifrosting adsorbing film. Furthermore, the Scholz window or a windshield is considered by the examiner to be equivalent to applicant's claimed transparent glazing having at least one viewing area.

8. Scholz teaches that the coating composition is applied to the surface of the substrate (glass or window) (column 3, lines 20-35). The coating composition contains a binder, which can be a material such as polyvinylpyrrolidone (PVP), polyvinyl alcohol (PVA), polyvinyl acetate (PVAc), and polyurethane's (PU) (column 19, lines 60-67). It is noted that PVP, PVA, PVAc, and PU are specifically recited in the claims and the specification as types of hydrophilic polymer binder that are suitable for use in the instant invention.

9. Therefore it would have been obvious to one of ordinary skill in the art to utilize PVP, PVA, PVAc, or PU as the polymer binder in Scholz, as Scholz recognizes the equivalence of these materials to the other materials listed as a suitable material for use as the polymeric binder.

10. In addition to the binder, the coating composition comprises at least inorganic metal oxide particles and a surfactant having at least one hydrophilic and one hydrophobic group (column 3, lines 20-35). The inorganic metal oxide particles can be a network of titanium oxide (equivalent to titania) nanoparticles that are arranged so as to form a porous network (column 4, line 22-column 5, line 30). The surfactant has at least one polar group, and can be an alky pyrrolidone (column 8, lines 1-20)

11. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize titanium oxide nanoparticles as the inorganic oxide nanoparticles and an alkyl pyrrolidone as the surfactant in Scholz, as Scholz recognizes the equivalence of these materials to other materials listed as suitable for forming the inorganic oxide network and surfactant respectfully.

12. Still further, Scholz teaches that the coating composition may contain a coupling agent that is capable of binding the surfactant in the composition with the metal oxide particles (column 16, lines 43-45). Suitable coupling agents include silanes, siloxanes, and tetraalkoxy coupling agents such as tetraethylorthosilicate (column 16, line 65-column 17, line 63).

13. Therefore it would have been obvious to one of ordinary skill in the art to select tetraethylorthosilicate as the coupling agent in Scholz et al.

14. One would have been motivated to select tetraethylorthosilicate due to the teaching in Scholz et al. of the functional equivalence of tetraethylorthosilicate to the other coupling agents listed as suitable.

15. The examiner notes that the applicant later requires the antifrosting adsorbing film to contain an inorganic or organic absorbent material, wherein the inorganic material can be a mesoporous material, such a titania nanoparticles or an orthosilicate condensation product. The examiner considers the titanium oxide nanoparticles network taught by Scholz to be equivalent to applicants claimed mesoporous material formed from titania nanoparticles. The examiner considers the tetraethoxy orthosilicate

coupling agent taught by Scholz to be equivalent to applicant's claimed orthosilicate condensation product.

16. It is noted that Scholz typically forms the film to a thickness of 500-2500 angstroms (column 21, lines 1-21). This thickness explicitly meets several of the thickness limitations required by the instant claims. Further, the coating composition is typically formed on a primer layer that has been applied to the surface of the substrate (column 8-12). The primer layer improves the adhesion of the film to the substrate.

17. Thus, as is clear from the discussion above, Scholz renders obvious an antifogging film, wherein the antifogging film comprises a hydrophilic PVP, PVA, PVAc, or polyurethane binder, a hydrophilic polymer surfactant, titanium oxide nanoparticles arranged in a porous oxide network, and a tetraethoxy orthosilicate coupling agent. Further, Scholz renders obvious the formation of this antifogging film onto a primer layer that has been previously deposited onto a glass substrate such as a window.

18. However, Scholz does not teach applicant's claim 27 limitation which requires the film to prevent fogging/frosting for at least 3 minutes after it has been refrigerated for a specific time and at a specific temperature and rapidly exposed to room temperature and humidity.

19. With the above deficiency in mind, the examiner notes that the film detailed by Scholz utilizes a similar if not identical binder (PVP, PVA, PVAc, or PVU) as that utilized by the invention. In addition, the Scholz film utilizes similar if not identical inorganic/organic absorbent materials (porous inorganic titanium oxide network, tetraethoxy orthosilicate, hydrophilic polymer surfactants) as those utilized by the instant

invention). Still further, the film of Scholz meets many of the thickness requirements of the instant claims and is deposited on a primer layer that is similar if not identical to that utilized by the instant invention.

20. It has been held that where claimed and prior art products are identical or **substantially identical in structure or composition**, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established and **the burden of proof is shifted to applicant** to show that prior art products do not necessarily on inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC 102 or on *prima facie* obviousness under 35 USC 103, jointly or alternatively. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the *prime facie* case can be rebutted by ***evidence*** showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d at 1255, 195 USPQ at 433.

21. In view of the substantial similarities between the structure and composition of the Scholz product and the product of the instant invention, the examiner takes the position that the property limitation required by claim 27 will be necessarily met by the Scholz film, as there is no evidence of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

22. Claim 28 requires the film to be deposited on the surface of the glazing. It is noted that Scholz teaches that the primer layer is optional (column 20, lines 8-12). Thus, when the primer layer is not utilized this limitation is met.

23. Claim 29 requires the film to be deposited on a polymeric film that is fastened to the glazing. This limitation is met as set forth above for claim 27.

24. Claim 31 requires the film to comprise at least one hydrophilic polymer and an absorbent material that is porous to water. This limitation is met as set forth above. The hydrophilic polymer binders or surfactants discussed in Scholz are equivalent to applicant's claimed hydrophilic polymer. The porous titanium oxide network and/or tetraethoxy orthosilicate coupling agent is equivalent to applicant's claimed absorbent material porous to water.

25. Claim 33 limits the hydrophilic polymer to a group of materials. Scholz discloses these materials as discussed above for claim 27.

26. Claim 34, limits the hydrophilic polymer to a polymer or copolymer of vinyl-pyrrolidone. This limitation is met as set forth above for claim 27.

27. Claim 35 is met as set forth above for claim 33.

28. Claims 36-40 are met as set forth above for claim 27.

29. Claims 41-43 require the absorbent material to have specific levels of porosity in the wet state. Though Scholz does not teach these limitations, Scholz does teach that pore volume (equivalent to applicant's claimed porosity) impacts the refractive index and antireflective properties of the film. Specifically, Scholz teaches that the porosity of the film is controlled by the concentration of surfactant in the film. If too much surfactant is

used, the void volume decreases, thereby increasing refractive index beyond a desired value and reducing antireflective properties (see column 8, lines 30-65). However, the surfactant is necessary to achieve a film exhibiting antifogging properties. Thus, the porosity of the film is a results effective variable.

30. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the porosity of the film of Scholz to a desired value so as to obtain a film with a desired level of antireflective properties and refractive index.

31. Claims 44-46 require the absorbent material porous to water to have a pore diameter between 0.05-50 microns, more preferably 0.1-20 microns, and most preferably 1-15 microns in the wet state. The examiner acknowledges that Scholz does not specifically teach the claimed pore size "in the wet state." However, as the coating composition of Scholz is manufactured from identical materials to those disclosed in the instant specification (specifically a PVP film containing titanium oxide particles arranged in a porous inorganic oxide network), the examiner takes the position that these limitations are met. The applicant should note that the examiner does not interpret the "mean diameter" of a pore to require that the diameter of a pore in all directions (i.e. three-dimensional pore diameter that requires both the width **and** depth of the pore to be 1-15μ). Rather, the examiner interprets "mean diameter" to mean the average two-dimensional diameter of a pore. Thus, the depth of the pore is not required to be the claimed value. Accordingly, a film that is thinner than 1-15μ can still meet the claimed pore diameter. The applicant is referred to the citation of In re Best above.

32. Claims 47-48 require the antifrosting adsorbent film to have a thickness less than 100μ, more specifically less than 20μ. These limitations are met as set forth above for claim 27.

33. Claim 50 requires a method for preventing the visible formation of condensation and frosting on a transparent glazing for at least 3 minutes upon rapid exposure to room temperature and humidity after being maintained in a closed refrigerated environment at -28^0 C which comprises: depositing an antifrositing adsorbent layer on said glazing, wherein the antifrosting adsorbent layer comprises at least one hydrophilic polymer and an absorbent material porous to water.

34. As written, claim 50 merely requires the deposition of an antifrosting adsorbent layer onto a transparent glazing, wherein the antifrosting adsorbent layer comprises at least one hydrophilic polymer and an absorbent material porous to water. Accordingly, the limitations of claim 50 are met as set forth above for claim 27.

35. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scholz as applied to claim 29 above, and further in view of Hayakawa Rubber Co. (JP05-222227).

36. Scholz as set forth above for claim 29 fails to teach applying an adsorbent anti-frosting coating to the surface of a polycarbonate film that is applied to a transparent glazing.

37. However, Hayakawa Rubber (Hayakawa) teaches forming anti-fogging coatings on polycarbonate films (abstract). Once the anti-fogging coating is applied to the polycarbonate film, the film can be applied to transparent moldings mad of glass or

plastic. By forming the anti-fogging coating on the polycarbonate film, the anti-fogging coating can be adhered to the molding without strong adhesives, and can be peeled and changed easily, enabling the anti-fogging film to be changed (abstract).

38. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the anti-fogging coating of Scholz on the polycarbonate film prior to applying the anti-fogging film to a glass or plastic substrate, as taught by Hayakawa.

39. One would have been motivated to make this modification in lieu of the teaching in Scholz that the anti-fogging coating is suitably applied to polycarbonate film substrate (see column 20, lines 15-25), and the teaching in Hayakawa that by applying an anti-fogging coating to a polycarbonate film, the anti-fogging coating can be adhered to glass substrates without the use of strong adhesives, and can be peeled and changed easily.

40. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scholz as applied to claim 31 above, and further in view of Creasy et al. (US5262475).

41. Scholz et al. does not teach a hydrophilic polymer that is crosslinked, as required by claim 31.

42. However, Creasy et al. teaches that crosslinking PVP when it is use d anti-fogging compositions provides a degree of control over the properties of the resulting coating. By controlling the crosslink density of the PVP, films that are hard and scratch resistant (high crosslinking) or films that are soft and flexible (low crosslinking) can be

formed (column 5, lines 38-51). Further, by crosslinking PVP, strong, clear, and chemically resistant films can be formed (column 3,m lines 13-21)

43. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to crosslink the PVP binder resin taught by Scholz et al.

44. One would have been motivated to make this modification due to the teaching in Creasy et al. that the properties of the resulting coating could be tailored by controlling the amount of crosslinking in the PVP polymer, and the fact that clear, strong, and chemically resistant films are formed from crosslinked PVP.

45. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scholz as applied to claim 47 above, and further in view of Hatekeyama et al. (US6394613).

46. Scholz fails to teach a water adsorbing film having a thickness that is $\geq$14.5 but $\leq$100μ, as required by claim 49.

47. However, Hatekeyama teaches an antifogging coating that is similar to that of Scholz, and teaches that if the coating is less than 1μ thick, the anti-fogging properties of the film are reduced, and if the film is formed to be grater than 20μ thick, the film is not uniform (see column 4, lines 1-8)

48. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the anti-fog coating of Scholz to a thickness of 20μ, in view of the teaching in Hatekeyama that an anti-fogging film (similar to Scholz' film) that is 20μ thick exhibits improved antifogging properties over a film that is less than 1μ thick.

49. Regarding the modification of Scholz with Hatekeyama. The examiner acknowledges that Scholz teaches that the anti-fog/anti-reflection film is suitably formed to a thickness between 500-2500 angstroms, which is substantially thinner than that suggested by Hatekeyama. Scholz also teaches that if the film is formed outside this thickness range, the antireflection properties of the film may decrease drastically. This statement in Scholz merely teaches that controlling the thickness of the film within 500-2500 angstroms optimizes the films antireflection properties, it does not teach away from the use of another thickness. This is particularly true given the fact that Scholz requires no minimum amount of antireflection, and is also concerned with the film exhibiting good antifogging properties. Further, Hatekeyama clearly shows that a film similar to the Scholz film exhibits reduced antifogging properties when it is less than 1μ thick. Thus, the prior art is basically teaching that by controlling the thickness of an anti-fogging film, the anti-fogging or antireflection properties of the film can be optimized. Thus, given that the Scholz patent requires no minimum amount of antireflection, one of ordinary skill would have been motivated with a reasonable expectation of success to modify the Scholz film per the teachings of Hatekeyama so as to obtain a film having improved anti-fogging properties.

50. Claims 27 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Florentin et al. (US6052965) in view of Scholz et al.

51. Claim 51 requires a refrigerated door enclosure comprising the transparent glazing of claim 1.

52. Regarding these limitations, Florentin et al. teaches a door or wall of an environmental chamber, in particular a glazed door or wall, and more particularly a refrigerated chamber in which cold or frozen products are displayed (column 1, lines 7-13). This environmental chamber consists of an insulating panel comprising at least two glass substrates, which are separated from one another via surfaces mounts. The space between the two glass sheets is a vacuum (column 3, lines 5-10). Florentin et al. teaches that this vacuum insulating glazing panel exhibits better thermal insulating properties then prior known insulating panels (column 4, lines 25-32 and Table 1). Florentin teaches depositing a thin layer of conductive material around the periphery of one of the surfaces of the vacuum insulating glazing, and a depositing separate conductive material on the center portion of the same surface, such that the center and periphery portions can be independently heated via a current provided by electrodes to prevent the appearance of condensation (i.e. fog) on the surface of the panel (column 6-20). Thus, the examiner takes the position that Florentin et al meets the requirement of a refrigerated door enclosure.

53. However, Florentin et al. does not teach an antifrosting adsorbent material comprising a hydrophilic polymer and an absorbent material porous to water, as required by claim 51.

54. However, Scholz et al. as stated above for claims 1-3, 6-8, 10, 19-23 and 26 teaches an anti-fogging composition that comprises a hydrophilic polymer and a porous metal oxide. Such a composition is effective for the prevention of fog on a number of substrates, including windows (column 3, lines 60-65). In particular, the film is useful on

surfaces where there is a large temperature and humidity difference (column 1, lines 59-61) A refrigerated door enclosure such as that disclosed by Florentin would be readily recognized by one of ordinary skill in the art as a place where a surface would be routinely exposed to large temperature and humidity differences.

55. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the anti-fogging coating composition taught by Scholz et al. on the viewing surfaces of the vacuum insulated glazing taught by Florentin et al.

56. One would have been motivated to make this modification due to the fact that the Scholz et al. coating composition does not require power to operate, and thus would provide a reduction in the operating cost of the environmental chamber taught by Florentin et al.

57. While the examiner acknowledges that neither Florentin nor Scholz teaches utilizing an anti-fog coating composition comprising a hydrophilic polymer and an absorbent material porous to water on a refrigerated window enclosure, these references are both directed towards solving a similar problem, namely preventing a window from losing its transparency due to condensation forming on the surface of the window. As Scholz teaches a solution to this problem that does not require power, there is clear motivation to substitute the anti-fog film taught by Scholz for the current heating solution of Florentin.

Response to Arguments

58. The examiners notes that no arguments were filed along with the request for continued examination.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 571-272-1517. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J. Thibodeau can be reached on 571-272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NJU
nju

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700